The Fungal Network of New Zealand (FUNNZ) has been organising an annual Fungal Foray that’s alternated between the North and South Islands since 1986. From 11-16th April 2021, Michael Bartlett and Kiryn Dobbie had the opportunity to represent Scion and participate in the 34th Fungal Foray held for the first time on Rakiura/Stewart Island. This year 40 attendees, including some of New Zealand’s foremost mycology experts, set out to find, photograph and catalogue fungi of all shapes and sizes.

During the week, the various tracks and the surrounding forest around Oban were investigated in the mornings. Keen eyes looked amongst leaf litter, on tree stumps and logs, and on the trunks, branches and leaves of living trees for specimens to collect. There were also trips further afield to the spectacular Ulva Island, and to Mamaku Point conservation area. Both areas are wildlife sanctuaries, which are kept predator free and populated by beautiful native forest, native birdlife and interesting fungi. Each afternoon, specimens were displayed in Oban’s community hall to be catalogued and identified.

Some of these were then carefully set aside to be curated into fungal collections held by Manaaki Whenua Landcare Research (MWLC) and the University of Otago. Particularly interesting finds included a rare tooth fungus (Sarcodon carbonarius), entomopathogenic Cordyceps, the characteristic blue werewere-kōkako (Entoloma hochstetteri) and a variety of colourful wax caps and coral fungi.

The halfway point of the Foray was marked by a day of presentations, including talks from both Michael and Kiryn, on fungal plant pathogens. There was a variety of interesting research presented; highlights included talks by Amy Martin (MWLC) and Toni Atkinson who both discussed different potential mutualisms with insects and birds and their possible role in the evolution of New Zealand’s brightly coloured truffle-like fungi; David Whyte (Zestos) presented on the use of Psilocybin (a naturally occurring psychedelic drug compound produced by some species of fungi) as a potential pharmaceutical; Bevan Weir’s (MWLC) discussion on the diversity of yeast and bacteria found in New Zealand’s kombucha; and an overview of the use of fungal pathogens as weed biocontrol agents in South Africa, from Alana den Breejen (MWLC).

Community outreach is also an important part of the Foray. Visits from interested locals and tourists, as well as groups of children from Halfmoon Bay school punctuated the week, sparking an interest in all things fungi. Locals know the area best, and while at the school on Friday, a tip led us on a quick trip across the town to a patch of earth stars (Geastrum sp.). These had not yet been seen on the Foray, and a specimen was collected for cataloguing.

A bioluminescing Mycena species.

Overall, the Foray was excellent; providing a great opportunity to strengthen the ties we have with our colleagues around New Zealand, develop our own skills and understanding, and to meet new people with a passion for mycology and pathology. Michael and Kiryn, and hopefully others, are looking forward to participating and sharing at future Fungal Forays.

Michael Bartlett and Kiryn Dobbie
Scion

Thanks to our summer heroes!

Every summer, the Forest Protection team hosts a horde of summer students that significantly contribute to our research during the busiest time of the year, as well as undertaking their own original research pieces. We are forever thankful for their hard work and efforts this summer. Below is a snapshot of the projects and research they were involved with.

Victoria Dick from Toi Ohomai Institute of Technology and Taawhio Briers from the University of Waikato worked on the Biodiversity in New Zealand Forests project. They primarily assisted with installing and servicing canopy-based insect traps across multiple pine and native forest sites in Kinleith Forest. In the lab, both students worked tirelessly to pin, label, and help sort nearly 10,000 beetles from almost 600 species collected from those traps.
The Eucalyptus tortoise beetle biocontrol project hosted three students this summer. Frances James joined us from The University of Canterbury, and her role within this project focused on line-rearing of the parasitoid wasp Eadya daenerys within tortoise beetle larvae. The line rearing in containment prevents any potential spread of disease present within the imported parents. Overall, the 2020-2021 mass rearing of E. daenerys was successful, with a total of 5109 parasitised larvae placed into the soil to pupate.

Carmen Swan joined us from the University of Waikato. She assisted with all aspects of the line-rearing of E. daenerys within tortoise beetle larvae in containment. She also completed her own experimental work to further trial methods to improve mating when females are reluctant to accept the male courtship.

Ryan Barlow joined us from the University of Waikato. Ryan also assisted with all aspects of the line-rearing of E. daenerys within tortoise beetle larvae in containment. He also completed a trial to see if we could enhance the beetle larvae’s survival by surface sterilisation of egg batches, as is routinely conducted on other insect colonies. In this case, sterilisation did not improve laboratory survival. Some other treatments using different proportions of bleach could be trialled in the future.

Ngaio Balfour from the University of Auckland aimed to determine if a build-up of myrtle rust on highly susceptible Lophomyrtus hosts leads to infection on climbing rātā species. Ngaio took the lead in designing an ambitious project, which included both experimental inoculation in containment at Scion and collecting data from field sites in Taranaki and Rotorua. While we are continuing to work with Ngaio to analyse the data, preliminary examination supports the hypothesis that increasing spore concentrations in the environment leads to more severe disease levels on moderately susceptible hosts.

Jessica Chen from the University of Otago has joined Scion for the summer working remote to our regular sites. Jessica has been working on the SFFF project on Poplar Sawfly. This invasive pest of poplars has been recorded in Dunedin, the only southern hemisphere location in its global distribution. Jessica has been monitoring two heavily infested sites. Over the season, she has observed and recorded female sawflies laying eggs and then tracked those eggs through their lifecycle. Already we have shown much of the data on this pest’s biology, reported from the northern hemisphere, is not correct or is different here in New Zealand.

Nichollas Sharp from Toi Ohomai Institute of Technology supported the granulate ambrosia beetle - GAB (Xylosandrus crassiusculus) project. He helped monitor GAB activity in the urban environment in the Auckland region and assess drivers of host susceptibility. The research involved assessing trapping methods with a view to testing traps and lures to acquire preliminary knowledge on beetle phenology, local beetle density and dispersal. Nicky spent many hours in the lab behind a microscope sorting GAB and other bycatch.

Liam Wynn from Toi Ohomai Institute of Technology worked on improving the efficacy of lures to attract bark beetles by screening new plant volatiles (‘odours’) with two bark beetle species in the lab using a Y-Tube olfactometer. Both beetles are a phytosanitary risk for export logs. Despite several challenges with his project, Liam made good progress and has given Scion scientists valuable insight for future research.

Rachel Langman was a key team member that supported several Myrtle Rust (Austropuccinia psidii) research projects. Rachel took on new challenges with enthusiasm, developing skills in ecological monitoring, with her optimism being invaluable. We wish Rachel all the best in her future studies at the University of Waikato.

Forest Protection staff